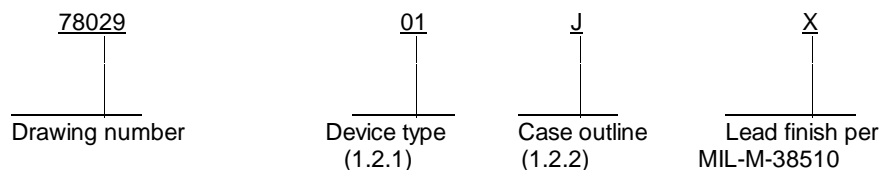


REVISIONS																			
LTR	DESCRIPTION										DATE (YR-MO-DA)					APPROVED			
E	Correct errors on figure 1, figure 2, and tables 1 and 2. Convert to military drawing format. Editorial changes throughout.										10 Apr. 87					N A Hauck			
F	Changes to table I. Editorial changes throughout.										13 OCT. 87					R P Evans			
CURRENT CAGE CODE 67268																			
REV																			
SHEET																			
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SHEET																			
REV STATUS OF SHEETS				REV		F	F	F	F	F	F	F	F	F	F	F	F	F	
				SHEET		1	2	3	4	5	6	7	8	9	10	11	12	13	
Defense Electronics Supply Center Dayton, Ohio Original date of drawing: 6 APRIL 1979 AMSC N/A				PREPARED BY James Nicklaus						MILITARY DRAWING This drawing is available for use by all Departments and Agencies of the Department of Defense									
				CHECKED BY D A Di Cenzo															
				APPROVED BY N A Hauck						TITLE: MICROCIRCUITS, DIGITAL, CMOS, ENCODER-DECODER, MONOLITHIC SILICON									
				SIZE A		CODE IDENT. NO. 14933													
				REVISION LEVEL F						DWG NO. 78029									
						SHEET 1 OF 13													

1. SCOPE

1.1 Scope. This drawing describes device requirements for class B microcircuits in accordance with 1.2.1 of MIL-STD-883, "Provisions for the use of MIL-STD-883 in conjunction with compliant non-JAN devices".

1.2 Part number. The complete part number shall be as shown in the following example:



1.2.1 Device types. The device types shall identify the circuit function as follows:

<u>Device type</u>	<u>Generic number</u>	<u>Circuit</u>
01	15530017	CMOS manchester encoder-decoder

1.2.2 Case outlines. The case outlines shall be as designated in appendix C of MIL-M-38510, and as follows:

<u>Outline letter</u>	<u>Case outline</u>
J	D-3 (24-lead, 1/2" X 1-1/4"), dual-in-line package
3	C-4 (28-terminal, .450" X .450") square chip carrier package

1.3 Absolute maximum ratings.

Supply voltage range	+7.0 V dc
Input or output voltage applied	GND -0.3 V dc to $V_{CC} + 0.3$ V dc
Thermal resistance, junction-to-case (θ_{JC}):	
Cases E and F	See MIL-M-38510, appendix C
Junction temperature (T_J)	+175° C
Operating temperature range	-55° C to +125° C
Storage temperature range	-65° C to +150° C
Maximum power dissipation (P_D)	55 mW
Lead temperature (soldering, 10 seconds)	+300° C

1.4 Recommended operating conditions.

Supply voltage range	4.50 V to 5.50 V
Minimum high level input voltage:	
Logic inputs	$V_{IH} = 70\% V_{CC}$
Clock inputs	$V_{IHC} = V_{CC} - 0.5$ V
Maximum low level input voltage:	
Logic inputs	$V_{IL} = 20\% V_{CC}$
Clock inputs	$V_{ILC} = V_{CC} + 0.5$ V
Case operating temperature range (T_C)	8 ns maximum
Encoder/decoder clock rise time (t_{ECR} , t_{DCR})	8 ns maximum
Encoder/decoder clock fall time (t_{ECF} , t_{DCF})	0 MHz minimum
Send clock frequency (fESC)	0 MHz minimum

MILITARY DRAWING
DEFENSE ELECTRONICS SUPPLY CENTER
DAYTON, OHIO 45444

SIZE
A

CODE IDENT. NO.
14933

78029

REVISION LEVEL
F

SHEET
2

Encoder/decoder data rate (f_{ED} , f_{DD}) 0 MHz minimum
 Operating supply current, (I_{CCOP}) 10 mA ($V_{CC} = 5.50$ V, $f = 1$ MHz)
 Sync transition span (t_{D2}) $18 t_{DC}$ typical $\underline{2/}$
 Short data transition(t_{D4}) $6 t_{DC}$ typical
 Long data transition(t_{DS}) $12 t_{DC}$ typical

2. APPLICABLE DOCUMENTS

2.1 Government specification and standard. Unless otherwise specified, the following specification and standard, of the issue listed in that issue of the Department of Defense Index of Specifications and Standards specified in the solicitation, form a part of this drawing to the extent specified herein.

SPECIFICATION

MILITARY

MIL-M-38510 - Microcircuits, General Specification for.

STANDARD

MILITARY

MIL-STD-883 - Test Methods and Procedures for Microelectronics.

(Copies of the specification and standard required by manufacturers in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting activity.)

3. REQUIREMENTS

3.1 Item requirements. The individual item requirements shall be in accordance with MIL-M-38510, and as specified herein. The country of manufacture requirement of MIL-M-38510 does not apply.

3.2 Design, construction, and physical dimensions. The design, construction, and physical dimensions shall be as specified in MIL-M-38510 and herein.

3.2.1 Terminal connections. The terminal connections shall be as specified on figure 1.

3.2.2 Timing waveforms. The timing waveforms shall be as specified on figure 2.

3.2.3 Case outlines. The case outlines shall be in accordance with 1.2.2.

3.3 Electrical performance characteristics. Unless otherwise specified, the electrical performance characteristics are as specified in table I and apply over the full recommended case operating temperature range.

3.4 Marking. Marking shall be in accordance with MIL-STD-883 (see 3.1 herein). The part shall be marked with the part number listed in 1.2 herein. In addition, the manufacturer's part number may also be marked as listed in 6.4 herein.

3.5 Certificate of compliance. A certificate of compliance shall be required from a manufacturer in order to be listed as an approved source of supply in 6.4. The certificate of compliance submitted to DESC-ECS prior to listing as an approved source of supply shall state that the manufacturer's product meets the requirements of MIL-STD-883 (see 3.1 herein) and the requirements herein.

$\underline{2/} t_{DC} = \text{Decoder clock period} = 1/f_{DC}$.

MILITARY DRAWING DEFENSE ELECTRONICS SUPPLY CENTER DAYTON, OHIO 45444	SIZE A	CODE IDENT. NO. 14933	78029
		REVISION LEVEL F	SHEET 3

TABLE I. Electrical performance characteristics.

Test	Symbol	Conditions <u>1/</u> $-55^{\circ}\text{C} \leq T_C \leq +125^{\circ}\text{C}$	Group A subgroups	Limits		Unit
				Min	Max	
Input high voltage	V_{IH}		1, 2, 3	$0.7 V_{CC}$		V
Input low voltage	V_{IL}		1, 2, 3		$0.2 V_{CC}$	V
Input high clock voltage	V_{IHC}		1, 2, 3	$V_{CC} - 0.5$		V
Input low clock voltage	V_{ILC}		1, 2, 3		GND +0.5	V
Input leakage current	I_{IL}	$V_{IN} = 0 \text{ V or } V_{CC}$	1, 2, 3	-1.0	1.0	μA
High level output voltage	V_{OH}	$I_{OH} = -3 \text{ mA } \underline{2/}$	1, 2, 3	2.4		V
Low level output voltage	V_{OL}	$I_{OL} = 1.8 \text{ mA } \underline{2/}$	1, 2, 3		0.4	V
Standby supply current	I_{CCSB}	$V_{IN} = V_{CC} = 5.50 \text{ V output open}$	1, 2, 3		2.0	mA
Input capacitance	C_{IN}	See 4.3.1c, $V_{CC} = \text{open}$	4		15	pF
Output capacitance	C_O	See 4.3.1c, $V_{CC} = \text{open}$	4		15	pF
Function test	f_T	<u>3/</u>	7,8			
Encoder/decoder clock frequency	f_{EC} f_{DD}	$C_L = 50 \text{ pF}$	9, 10, 11	<u>5/</u>	15	MHz
Send clock frequency	f_{ESC}		9, 10, 11	<u>5/</u>	2.5	MHz
Encoder/decoder data rate	f_{ED} f_{DD}		9, 10, 11	<u>5/</u>	1.25	MHz
Decoder reset hold time	t_{DRH}		9, 10, 11	75		ns
Master and decoder reset pulse width	t_{MR} t_{DR}		9, 10, 11	150		ns
Decoder reset setup time	t_{DRS}		9, 10, 11	75		ns
Shift clock delay	t_{E1}	$C_L = 50 \text{ pF } \underline{4/}$	9, 10, 11		125	ns
Serial data setup	t_{E2}		9, 10, 11	75		ns
Serial data hold	t_{E3}		9, 10, 11	75		ns

See footnotes at end of table.

MILITARY DRAWING
DEFENSE ELECTRONICS SUPPLY CENTER
DAYTON, OHIO 45444

SIZE
A

CODE IDENT. NO.
14933

78029

REVISION LEVEL
F

SHEET
4

TABLE I. Electrical performance characteristics - Continued.

Test	Symbol	Conditions ^{1/} $-55^{\circ}\text{C} \leq T_C \leq +125^{\circ}\text{C}$	Group A subgroups	Limits		Unit
				Min	Max	
Enable setup	t_{E4}	$C_L = 50 \text{ pF}$ ^{4/}	9, 10, 11	90		ns
enable pulse width	t_{E5}		9, 10, 11	100		ns
Sync setup	t_{E6}		9, 10, 11	55		ns
Sync pulse width	t_{E7}		9, 10, 11	150		ns
Send data delay	t_{E8}		9, 10, 11	0	50	ns
Bipolar output delay	t_{E9}		9, 10, 11		130	ns
Enable hold time	t_{E10}		9, 10, 11	10		ns
Sync hold time	t_{E11}		9, 10, 11	95		ns
Bipolar data pulse width	t_{D1}	$C_L = 50 \text{ pF}$	9, 10, 11	$t_{DC} + 10$		ns
One zero overlap	t_{D3}		9, 10, 11		$t_{DC} - 10$	ns
Sync delay (on)	t_{D6}		9, 10, 11	-20	110	ns
Take data delay (on)	t_{D7}		9, 10, 11		80	ns
Serial data out delay	t_{D8}		9, 10, 11	0	110	ns
Sync delay (off)	t_{D9}		9, 10, 11	0	110	ns
Take data delay (off)	t_{D10}		9, 10, 11	0	110	ns
Valid word delay	t_{D11}		9, 10, 11	0	110	ns

^{1/} Unless otherwise specified, $V_{CC} = 4.50$ to 5.50 V dc and $T_C = -55^{\circ}\text{C}$ to $+125^{\circ}\text{C}$.

^{2/} Interchanging of force and sense conditions is permitted.

^{3/} Tested as follows: $f = 15 \text{ MHz}$, $V_{IH} = 70\% V_{CC}$, $V_{IL} = 20\% V_{CC}$, $C_L = 50 \text{ pF}$, $V_{OH} \geq 1.5 \text{ V}$ and $V_{OL} \leq 1.5 \text{ V}$.

^{4/} See figure 2.

^{5/} See 1.4 herein for this limit.

MILITARY DRAWING
DEFENSE ELECTRONICS SUPPLY CENTER
DAYTON, OHIO 45444

SIZE
A

CODE IDENT. NO.
14933

78029

REVISION LEVEL
F

SHEET
5

DEVICE TYPE 01

CASE J

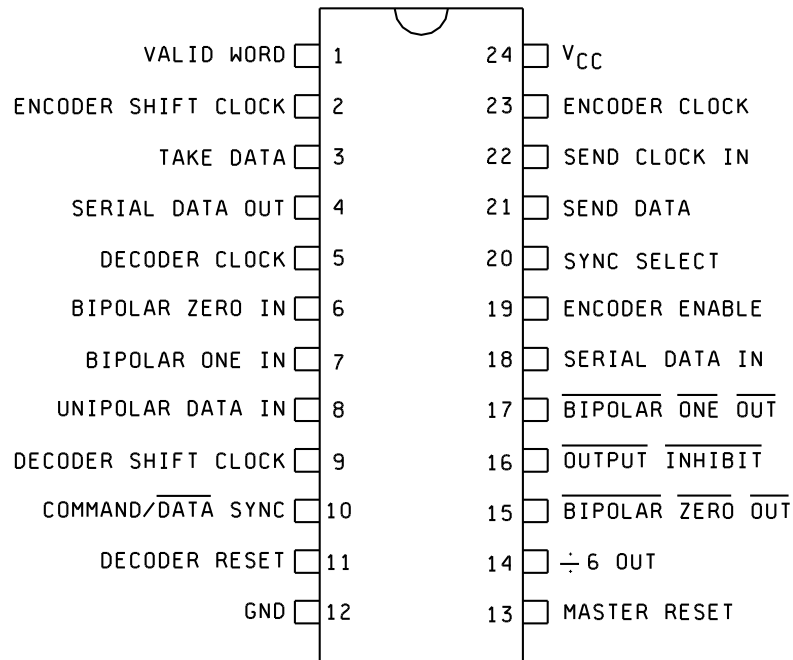


FIGURE 1. Terminal connections (top view).

MILITARY DRAWING
DEFENSE ELECTRONICS SUPPLY CENTER
DAYTON, OHIO 45444

SIZE
A

CODE IDENT. NO.
14933

78029

REVISION LEVEL
F

SHEET
6

DEVICE TYPE 01

CASE 03

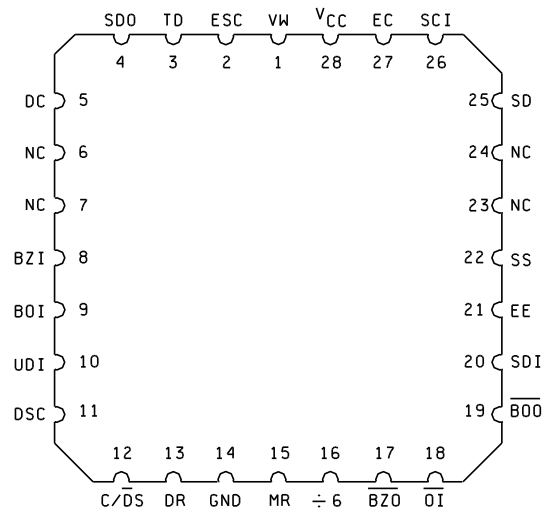


FIGURE 1. Terminal connections (top view) - Continued.

MILITARY DRAWING
DEFENSE ELECTRONICS SUPPLY CENTER
DAYTON, OHIO 45444

SIZE
A

CODE IDENT. NO.
14933

78029

REVISION LEVEL
F

SHEET
7

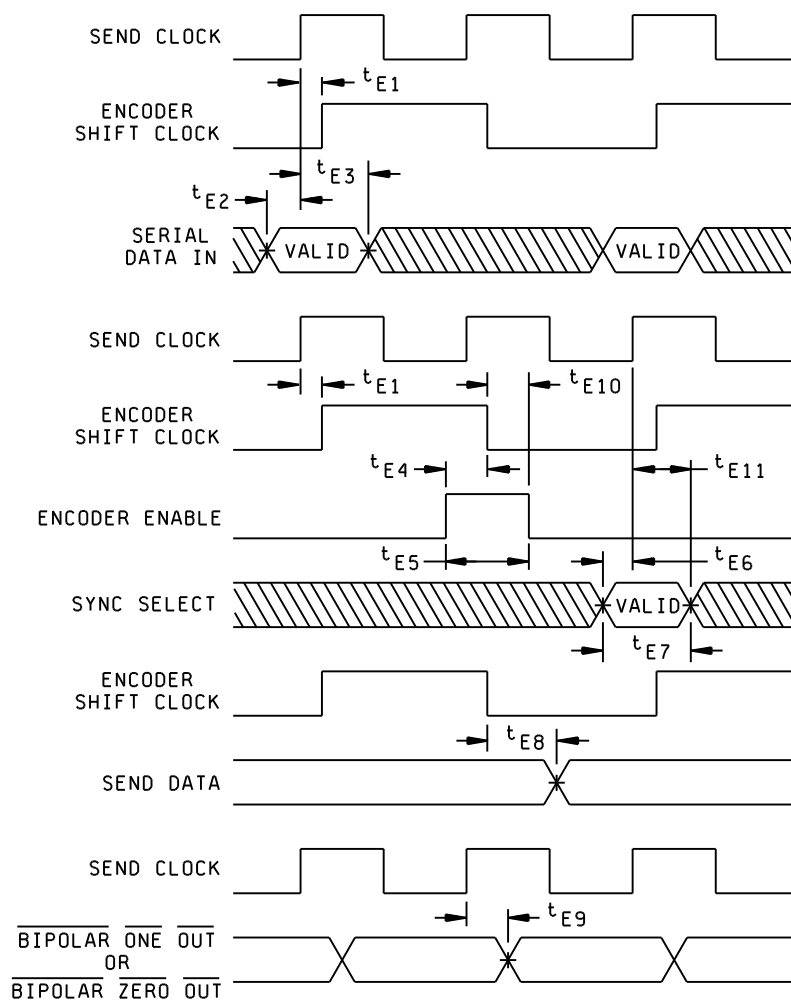


FIGURE 2. Timing waveforms.

MILITARY DRAWING
DEFENSE ELECTRONICS SUPPLY CENTER
DAYTON, OHIO 45444

SIZE
A

CODE IDENT. NO.
14933

78029

REVISION LEVEL
F

SHEET
8

DECODER TIMING

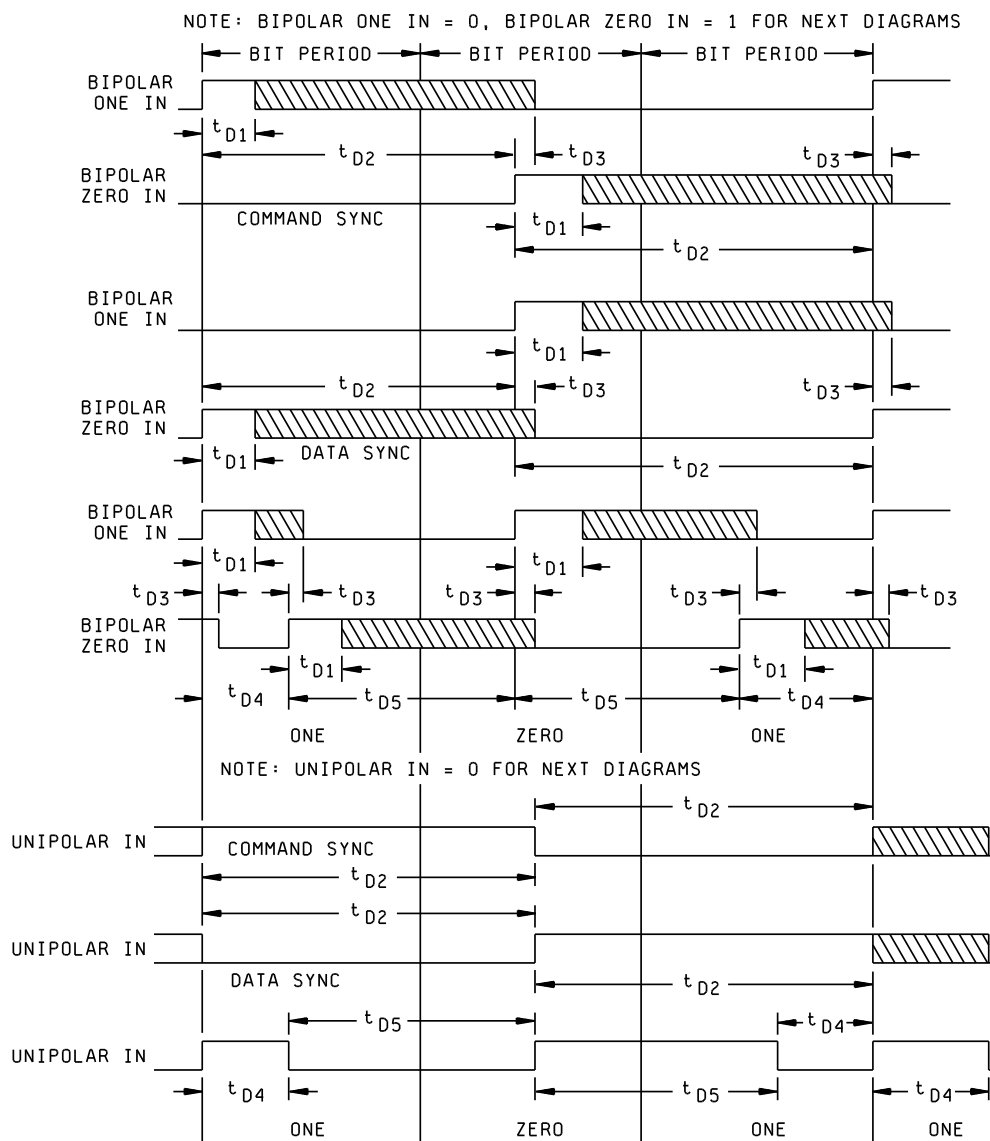


FIGURE 2. Timing waveforms - Continued.

MILITARY DRAWING
DEFENSE ELECTRONICS SUPPLY CENTER
DAYTON, OHIO 45444

SIZE
A

CODE IDENT. NO.
14933

78029

REVISION LEVEL
F

SHEET
9

DECODER TIMING

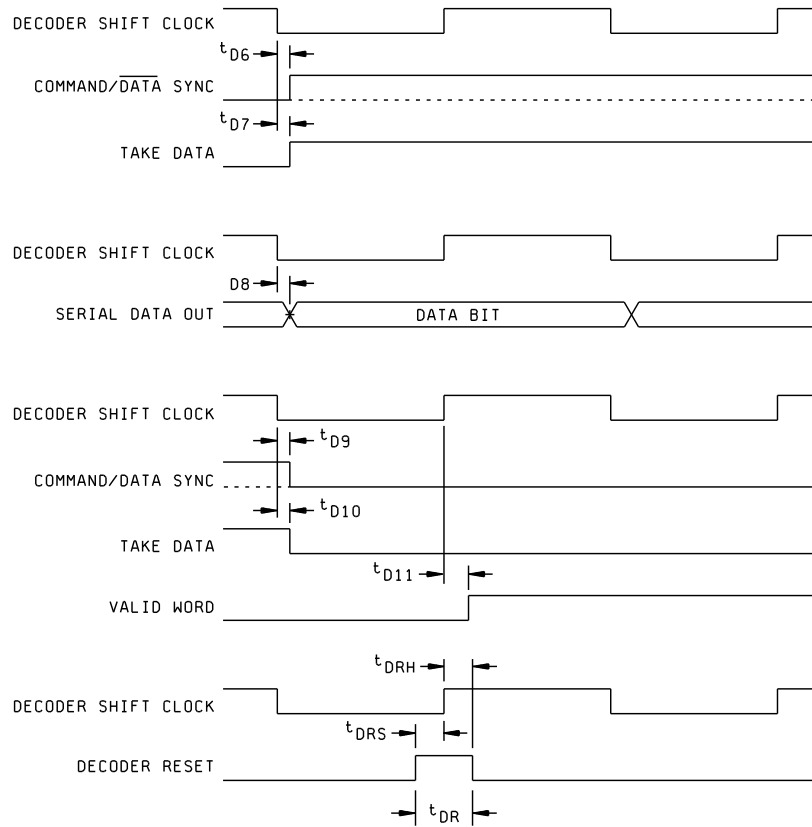


FIGURE 2. Timing waveforms - Continued.

MILITARY DRAWING
DEFENSE ELECTRONICS SUPPLY CENTER
DAYTON, OHIO 45444

SIZE
A

CODE IDENT. NO.
14933

78029

REVISION LEVEL
F

SHEET
10

3.6 Certificate of conformance. A certificate of conformance as required in MIL-STD-883 (see 3.1 herein) shall be provided with each lot of microcircuits delivered to this drawing.

3.7 Notification of change. Notification of change to DESC-ECS shall be required in accordance with MIL-STD-883 (see 3.1 herein).

3.8 Verification and review. DESC, DESC's agent, and the acquiring activity retain the option to review the manufacturer's facility and applicable required documentation. Offshore documentation shall be made available onshore at the option of the reviewer.

4. QUALITY ASSURANCE PROVISIONS

4.1 Sampling and inspection. Sampling and inspection procedures shall be in accordance with section 4 of MIL-M-38510 to the extent specified in MIL-STD-883 (see 3.1 herein).

4.2 Screening. Screening shall be in accordance with method 5004 of MIL-STD-883, and shall be conducted on all devices prior to quality conformance inspection. The following additional criteria shall apply:

a. Burn-in test (method 1015 of MIL-STD-883).

(1) Test condition A, B, C, or D using the circuit submitted with the certificate of compliance (see 3.5 herein).

(2) $T_A = +125^\circ\text{C}$, minimum.

b. Interim and final electrical test parameters shall be as specified in table II herein, except interim electrical parameter tests prior to burn-in are optional at the discretion of the manufacturer.

4.3 Quality conformance inspection. Quality conformance inspection shall be in accordance with method 5005 of MIL-STD-883 including groups A, B, C, and D inspections. The following additional criteria shall apply.

4.3.1 Group A inspection.

a. Tests shall be as specified in table II herein.

b. Subgroups 5 and 6 in table I, method 5005 of MIL-STD-883 shall be omitted.

c. Subgroup 4 (C_{IN} and C_O measurement) shall be measured only for the initial test and after process or design changes which may affect input capacitance.

4.3.2 Groups C and D inspections.

a. End-point electrical parameters shall be as specified in table II herein.

b. Steady-state life test (method 1005 of MIL-STD-883) conditions:

(1) Test condition A, B, C, or D using the circuit submitted with the certificate of compliance (see 3.5 herein).

(2) $T_A = +125^\circ\text{C}$, minimum.

(3) Test duration: 1,000 hours, except as permitted by appendix B of MIL-M-38510 and method 1005 of MIL-STD-883.

MILITARY DRAWING
DEFENSE ELECTRONICS SUPPLY CENTER
DAYTON, OHIO 45444

SIZE
A

CODE IDENT. NO.
14933

78029

REVISION LEVEL
F

SHEET
11

TABLE II. Electrical test requirements.

MIL-STD-883 test requirements	Subgroups (per method 5005, table I)
Interim electrical parameters (method 5004)	---
Final electrical test parameters (method 5004)	1*,2,3,7,8,9, 10,11
Group A test requirements (method 5005)	1,2,3,7,8,9, 10,11
Groups C and D end-point electrical parameters (method 5005)	1,7,9
Additional electrical subgroups for group C periodic inspections	---

* PDA applies to subgroup 1.

5. PACKAGING

5.1 Packaging requirements. The requirements for packaging shall be in accordance with MIL-M-38510.

6. NOTES

6.1 Intended use. Microcircuits conforming to this drawing are intended for use when military specifications do not exist and qualified military devices that will perform the required function are not available for OEM application. When a military specification exists and the product covered by this drawing has been qualified for listing on QPL-38510, the device specified herein will be inactivated and will not be used for new design. The QPL-38510 product shall be the preferred item for all applications.

6.2 Replaceability. Microcircuits covered by this drawing will replace the same generic device covered by a contractor-prepared specification or drawing.

6.3 Comments. Comments on this drawing should be directed to DESC-ECS, Dayton, Ohio 45444, or telephone 513-296-5375.

MILITARY DRAWING
DEFENSE ELECTRONICS SUPPLY CENTER
DAYTON, OHIO 45444

SIZE
A

CODE IDENT. NO.
14933

78029

REVISION LEVEL
F

SHEET
12

6.4 Approved sources of supply. Approved sources of supply are listed herein. Additional sources will be added as they become available. The vendors listed herein have agreed to this drawing and a certificate of compliance (see 3.8) has been submitted to DESC-ECS.

DESC drawing part number	Vendor CAGE number	Vendor similar part number <u>1/</u>	Replacement military specification part number
7802901JX 78029013X	34371 34371	HD1-15530-8 HD4-15530-8	<u>2/</u>

1/ Caution. Do not use this number for item acquisition. Items acquired to this number may not satisfy the performance requirements of this drawing.

2/ Military specification for M38510/50101 shown in revision "C" has been discontinued.

Vendor CAGE
number

34371

Vendor name
and address

Harris Semiconductor
P.O. Box 883e Road
Melbourne, FL 32901

MILITARY DRAWING
DEFENSE ELECTRONICS SUPPLY CENTER
DAYTON, OHIO 45444

SIZE
A

CODE IDENT. NO.
14933

78029

REVISION LEVEL
F

SHEET
13